# Including EPI distortion corrected files when using the Data Analysis Manager: temporary solution

*BrainVoyager version:* 22.2 *Latest update:* 26 January 2022



## Summary

#### Preparation

- 1. Create the documents via DICOM to NIfTI
- 2. Create a first functional preprocessing workflow with just one or some of the preprocessing functions
- 3. Create a second functional preprocessing workflow with the remaining preprocessing functions
- 4. Edit the workflowinfo \*.json file of the second functional preprocessing workflow

#### Execution

- 5. Run the first preprocessing workflow
- 6. Run EPI distortion correction on the FMR data in the first preprocessing workflow folder
- 7. Run the second preprocessing workflow (and remaining workflows)

## **Detailed directions**

#### 1. Create the documents via DICOM to NIfTI

using the DICOM To NIfTI icon. The resulting \*.nii.gz and \*.json data will reside in the folder /(My) Documents/BrainVoyager/Projects/<project name>/sourcedata/sub-01/ses-01/func/.



#### 2. Create a first functional preprocessing workflow

with just one or some of the preprocessing functions (excluding spatial smoothing). This process will take the NIfTI/BIDS files as input and output FMR files. Go to the tab "Workflow" and click the "Create" button.



In the dialog, click on the "Functional preprocessing" text so that it is bright blue and click "OK".



The workflow is now available, but the "Input" and "Output" fields are empty.

Da	ta Workflows Log							
ID	Туре	Name		Input		Output	Subjects	
	Functional Preprocessing	func-preprocessing					ALL	
			Run All	Run Selected Skip exis	sting results		Create Connect	

Click on "Connect" to connect to the NIfTI/BIDS sourcedata. Click on "sourcedata" so that it is bright blue and click "Connect".

😑 🔿 Connect	Workflows	Connec	et Workflows
Source Workflows	Target Workflow	Source Workflows	Target Workflow
0: sourcedata	1: func-preprocessing	0: sourcedata	1: func-preprocessing
Clear Connections to Target	Cancel Connect	Clear Connections to Target	Cancel Connect

The "Input" and "Output" fields are now filled. Via the "Edit" button we see in the Workflow details that the input data are \*.nii.gz format ("extinp") and the file extension of the output data ("extout") are \*.fmr.

Da	ta Workflows L	.og						
ID	Туре		Name	Input	Output	Subjects		
1	Functional Prepr	ocessing	func-preprocessing	sourcedata: ses-01_task-noname_bold	ses-01_task-noname_bold_{funcpp_1}	ALL		
		0		Workflow				
		General Input-Out	Parameters Input-O put Mapping: 1 )	utput 1				
		Property		Value				
		extinp:	nii.gz					
		extout:	fmr					
		inpfile:	{sub-id}_ses-01_ta	ask-noname_{run-id}_bold				
L.,		outfile:	{sub-id}_ses-01_ta	ask-noname_{run-id}_bold_{funcpp_1}				
F	Remove	runs:			esults			
De	fault projects pa	session:	1		Stay on top	Show at start Options		
10.04		Variables i	in generic input / outp	ut file names:		///		
T	1956	Variable		Value	TO MAN	1310		
2		{funcpp_	1}:					

In the "Parameters" tab, set the required preprocessing functions to True, for example motion correction and slice scan time correction and click "OK".



#### 3. Create a second functional preprocessing workflow

with the remaining preprocessing functions: click the "Create" button again in the "Workflows" tab, and select "Functional preprocessing" in the appearing dialog. Check the remaining preprocessing methods; here the temporal high pass filtering is selected.

D	ata Workflows Log							
	D Type	Name	In	put		Output		Subjects
1	Functional Preprocessing	func-preprocessing	sourcedata: ses-0'	1_task-noname_bold	ses-01_tasl	k-noname_bold_{funcpp_1}	ALL	
2	Functional Preprocessing	func-preprocessing					ALL	
		0.	Workflow					
		General Parameters	Input-Output					
		Parameters						
		include mean int	ensity adjustment:	False				
		include motion c	orrection:	False				
		include slice sca	ntime correction:	False				
		include spatial s	moothing:	False				
		include tempora	l highpass filter:	✓ True				
		include tempora	l smoothing:	False				
	Remove Edit				st	ting results		Create
		reference vol	ume:					
D	efault projects path: /Volu	to other run:		0		Stay on top	Show at start	Option

Select the second preprocessing workflow and click the "Connect" button. In the appearing window, select "func-preprocessing", to use the data resulting from the first functional preprocessing workflow, and click "Connect".



Now the "Input" and "Output" fields of both workflows are filled with prospective data names.

	ata Workflows Log				
10	Туре	Name	Input	Output	Subjects
1	Functional Preprocessing	func-preprocessing	sourcedata: ses-01_task-noname_bold	ses-01_task-noname_bold_{funcpp_1}	ALL
	Functional Preprocessing	func-preprocessing	workflow 1: ses-01_task-noname_bold_{funcpp_1}	ses-01_task-noname_bold_{funcpp_1}_{funcpp_2}	ALL

#### 4. Edit the workflowinfo.json file of the second functional preprocessing workflow

adding "\_undist" when using COPE or "\_undistort" when using anatabacus to the "inpfile" and "outfile" fields in the workflowinfo.json file in the folder with workflow id 2: /workflow\_id-2\_type-1\_name-func-preprocessing/.



#### 5. Run the first preprocessing workflow

by selecting the first workflow and using the button "Run selected". The resulting files can be found in the folder data will reside in the folder /(My) Documents/BrainVoyager/Projects/<project name>/derivatives/workflow\_id-1\_type-1\_name-func-preprocessing/sub-01/ses-01/func/.

ID	Туре	Name	Input	Output
1	Functional Preprocessing	func-preprocessing	sourcedata: ses-01_task-noname_bold	ses-01_task-noname_bold_{funcpp_1}
2	Functional Preprocessing	func-preprocessing	workflow 1: ses-01_taskk-noname_bold_{funcpp_1}	ses-01_task-noname_bold_{funcpp_1}_{funcpp_
_				
	emove Edit		Run All Run Selected Skip existing results	Create Connect

A workflow report should appear.



Workflow: Functional preprocessing Workflow folder: workflow\_id-1\_type-1\_name-func-preprocessing Parameters: Parameter Value include mean intensity adjustment: no include motion correction: yes include slice scantime correction: yes include spatial smoothing: no include temporal highpass filter: no include temporal smoothing: no motion correction params 1 - reference volume: - to other run: 0

#### 6. Perform EPI distortion correction

on the FMR data in the first preprocessing workflow folder via the fieldmap-based EPI distortion correction plugin "anatabacus" or via the image registration-based EPI distortion correction plugin "COPE". For anatabacus, one needs magnitude and phase files (\*.fmr). For COPE, EPI data in AP and PA phase encoding direction are required.



Fieldmap-based EPI distortion correction



And the resulting files:

pe-1_name-func-prepro		preprocessing	Þ Þ	QA_Reports_ sub-01 sub-02 workflowinfo.json	Þ	ses-01	Þ	func 📃	•	<ul> <li>sub-01_ses-01_task-noname_run-01_bold_firstvol_as_anat.amr</li> <li>sub-01_ses-01_task-noname_run-01_bold_firstvol.fmr</li> <li>sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMC.log</li> <li>sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMC.sdm</li> <li>sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMCTS_undist.fmr</li> <li>sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMCTS_undist.stc</li> <li>sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMCTS_undist.stc</li> <li>sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMCTS_vndist.stc</li> <li>sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMCTS_vndist.stc</li> <li>sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMCTS_vndist.stc</li> </ul>	
	● • ● ₩ < >	workflowinfo.jz	son ) N	o Selection		🗋 workflowinfo	).json			sub-01_ses-01_task-noname_run-01_bold_SCCTBL_3DMCTS.stc sub-01_ses-01_task-noname_run-01_bold_SCCTBL_MotionCorrectedFirs	tV
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Perhaps place all \*\_undistort.fmr/stc files in a subfolder (in the screen capture below, the files are placed in "archive").

<b>ses-01</b>	Þ	func	Þ	archive	DM-Fourier.txt
				sub-01_ses-01_task-nonaCTBL_3DMCTS_undist.fmr sub-01_ses-01_task-nonaCTBL_3DMCTS_undist.stc	<ul> <li>sub-01_ses-01_task-nonabold_firstvol_as_anat.amr</li> <li>sub-01_ses-01_task-noname_run-01_bold_firstvol.fmr</li> <li>sub-01_ses-01_task-nonarun-01_bold_firstvol.stc</li> <li>sub-01_ses-01_task-nonabold_SCCTBL_3DMC.log</li> <li>sub-01_ses-01_task-nonaCCTBL_3DMCTS_vdm.map</li> <li>sub-01_ses-01_task-nonaCTBL_3DMCTS_vdm.map</li> <li>sub-01_ses-01_task-nonaold_SCCTBL_3DMCTS.stc</li> <li>sub-01_ses-01_task-nonaotionCorrectedFirstVol.amr</li> </ul>

Perhaps close BrainVoyager and re-open.

### 7. Run the second preprocessing workflow

by clicking the "Run selected" button.

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#### After preprocessing, a workflow report should appear.

BV Notebook - Workflow\_2\_1\_Report.bvnb [Projects > GSG4\_epidistcorr > derivatives > workflow\_id-2\_type-1\_name-func-preprocessing > \_QA\_Reports\_]

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	Wo	orkf	low	Re	рог	rt			

Project: GSG4\_epidistcorr

Workflow: Functional preprocessing

Workflow folder: workflow\_id-2\_type-1\_name-func-preprocessing

#### Parameters:

Parameter	Value
include mean intensity adjustment:	no
include motion correction:	no
include slice scantime correction:	no
include spatial smoothing:	no
include temporal highpass filter:	yes
include temporal smoothing:	no
motion correction params	

and the preprocessing has been recorded in the Log:

